

# PATENT SPECIFICATION

**1,138,790**



DRAWINGS ATTACHED

**1,138,790**

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## COMPLETE SPECIFICATION

### Improvements in or relating to Fixing Assemblies for use in Corrosive Conditions

- We, SOCIETE FINANCIERE ET INDUSTRIELLE DES ATELIERS ET CHANTIERS DE BRETAGNE, a French Body Corporate, of Prairie au Duc, Nantes, Loire Atlantique, France, do hereby  
5 declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—  
10 Articles which will be immersed in a corrosive medium are usually fixed together by means of stainless alloy screws or similar members. Unfortunately such alloys are relatively costly and often have poorer mechanical properties than stronger but oxidisable steels, such as carbon steels, and so in some cases it is advisable to use the latter kind of steels.  
15 This occurs more particularly in connection with the securing of the blades of marine propellers. The fixing screws used are large and experience severe stressing. The corrosive action of seawater is greatly increased by the electrolyte couple due to the contact between different metals — i.e. bronze, brass or stainless steel used for the blades, and the steel used for the fixing screws.  
20 It is an object of the present invention to provide an improved fixing assembly for use in corrosive conditions, such as in sea water.  
25 According to the invention there is provided a fixing assembly for use in corrosive conditions which comprises a screw or other fixing member having a head received in a recess in a member to be fixed, an annular cavity defined between the said head and the wall of the recess, and a protective cap fitting over the said head and closing the said cavity, characterised in that the cap is a dished member whose rim bears on a gasket to cause  
30 the same to engage the said head and also to engage the wall of the socket. Advantageously, the cap is devised to prevent the screw or other fixing member from working loose.  
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[Price 4s. 6d.]

The invention is illustrated by way of example in the accompanying drawings, in which: 45

Figure 1 is a plan view of a first embodiment of the invention;

Figure 2 is a section on the line II—II of Figure 1, and; 50

Figure 3 is a section through a further embodiment along the screw axis:

In the embodiment shown in Figures 1 and 2, two members, such as a hub 1 and a propeller blade 2, are assembled by means of a screw 3 which engages in a tapped hole 4 in the hub and whose head 5 bears on a shoulder 6 of the blade 2. The screw head 5 is completely inside a cylindrical recess 7 at the bottom of which is the shoulder 6. The screw head 5 is cylindrical and formed with a cruciform recess 9 and has a frusto-conical bearing surface 8 which flares toward the screw shank at the base of the cruciform recess 9. 55

The screw 3 is kept out of contact with any corrosive agent by means of a cap 10 substantially resembling a flat dished member so that no electrolytic corrosion occurs between the blade 2 and the cap 10; for example of stainless steel; the cap engages in the recess 7 and bears with its rim 11 on a gasket 12, for example of rubber, disposed in the annular cavity between the screw head and the wall of the recess on the frusto-conical bearing surface 8, the cap 10 tending to urge the gasket 12 against the wall of the recess 7. 70

The cap 10 is clamped to the gasket 12 by means of a central auxiliary screw 13 which extends through the cap 10, with the interposition of a gasket 14, to be screwed into a tapped hole 15 in the main screw 3. Associated with screw 13 is a locking tab 16 (Figure 2). When gasket 12 is clamped by cap 10 the required sealing tightness is provided and the main screw 3 is prevented from working loose. The cap 10 is prevented from turning relatively to the main screw 3 by means of a stud 17 engaging in the recess 9 and prevented from turning 75

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relative to the recess 7, by a stud 18 rigidly secured to a sector 19 welded to the blade 2. Stud 18 engages in a slot 20 in cap 10.

In the further embodiment shown in Figure

- 5 3, the same main elements as in the previous example occur, but the head of the auxiliary screw 13 is received inside a recess 21 in the cap 10, and a gasket 14 takes the form of a washer which is clamped between the auxiliary screw head and the base of the recess 21. The cap 10 is prevented from turning by means of a stud 22 which engages in a slot 23 in the blade 2 and which is screwed laterally into the cap 10. The part 24 of the screw head which is used for clamping has a non-circular cross-section, for instance, square or hexagonal, to which the inner cross-section of the rim 11 of the cap corresponds, so that the cap cannot turn relatively to the screw, the stud 22 thus preventing the screw from working loose.

WHAT WE CLAIM IS:—

1. A fixing assembly for use in corrosive conditions which comprises a screw or other fixing member having a head received in a recess in a member to be fixed, an annular cavity being defined between the said head and the wall of the recess, and a protective cap fitting over the said head and closing the said cavity, characterised in that the cap is a dished

member whose rim bears on a gasket to cause the same to engage the said head and also to engage the wall of the socket.

2. An assembly as set forth in claim 1, characterised in that the gasket is disposed on a frusto-conical bearing surface of the said head.

3. An assembly as set forth in either preceding claim characterised in that the cap is secured to the head by means of an auxiliary screw.

4. An assembly as set forth in any preceding claim, characterised in that abutments are provided to prevent the cap from turning relatively to the said head.

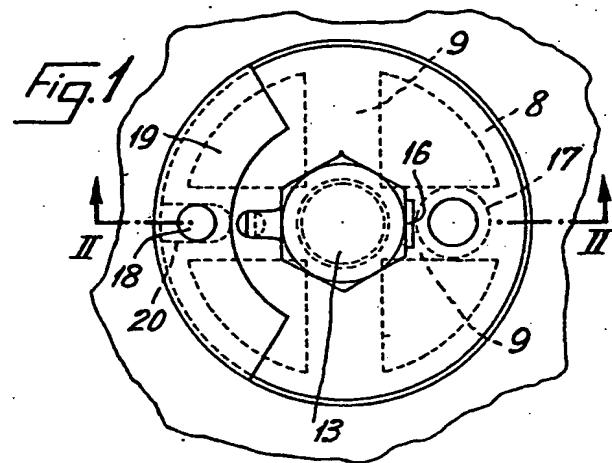
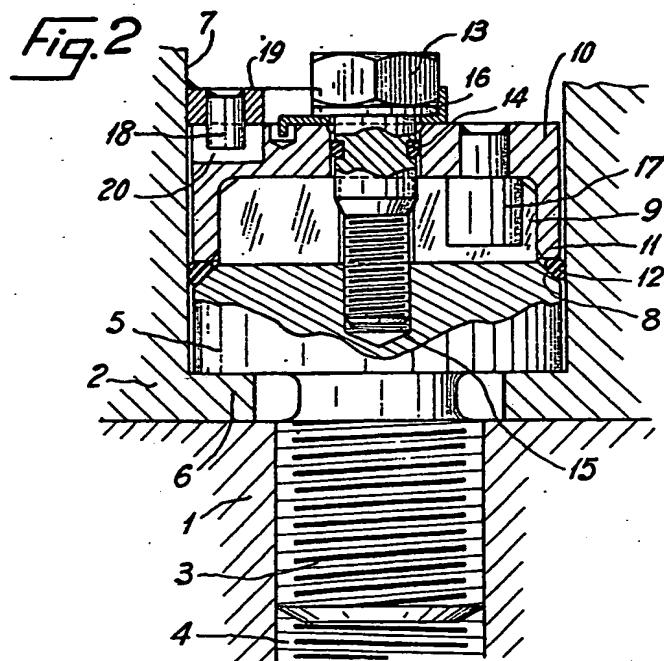
5. An assembly as set forth in any preceding claim, characterised in that abutments are provided to prevent the cap from turning relatively to the recess.

6. A fixing assembly for use in corrosive conditions substantially as herein described with reference to, and as illustrated in Figures 1 and 2, or Figure 3 of the accompanying drawings.

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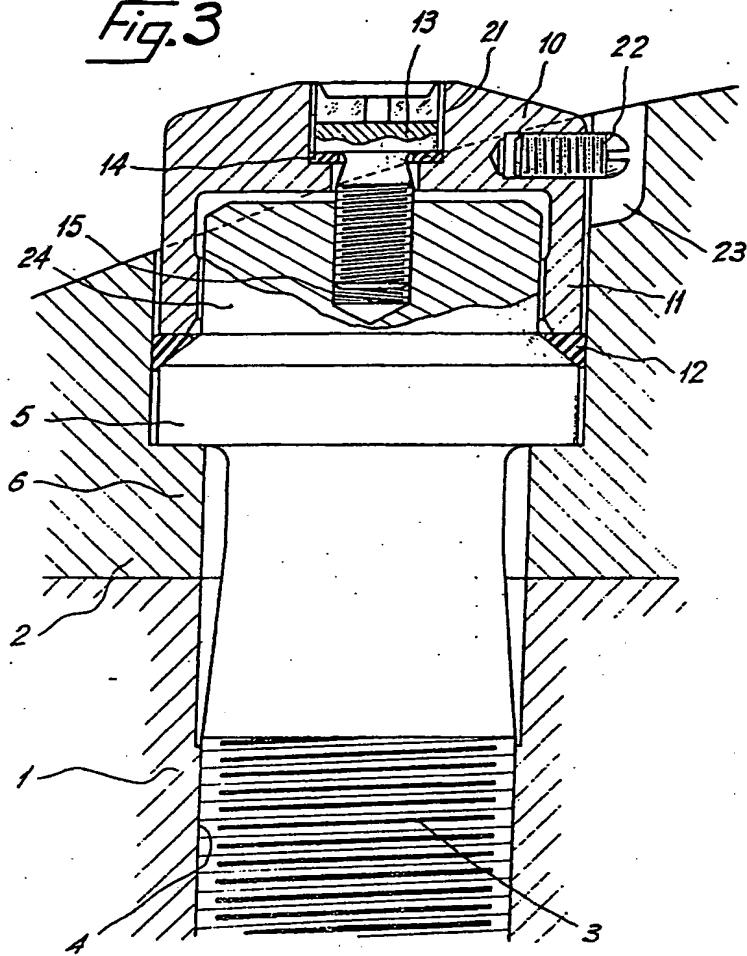
COMPLETE SPECIFICATION

2 SHEETS

*This drawing is a reproduction of  
the Original on a reduced scale*

Sheets 1 & 2

Fig. 3



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Sheets 1 & 2

